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## INSTINCT OR REASON?

G. W. AND E. G. PECKHAM.

IN our work on the instincts of solitary wasps<sup>1</sup> we included among the true instincts the way in which the wasp acts after bringing her prey to the nest, and gave as an example the habit of *Sphex ichneumonea* in placing her grasshopper at the entrance to the tunnel and then running in and out again before dragging it down. We also referred to the experiment of Fabre on a *Sphex*, in which he took advantage of the moment that the wasp was out of sight below to move her prey to a little distance, with the result that when the wasp came up, she brought her cricket to the same spot and left it as before, while she visited the interior of the nest. Since he repeated this experiment about forty times, and always with the same result, it seemed fair to draw the conclusion that nothing less than the performance of a certain series of acts in a certain order would satisfy her impulse. She must place her prey just so close to the doorway; she must then descend and examine the nest, and after that must at once drag it down, any disturbance of this routine causing her to refuse to proceed. We recently found a *Sphex ichneumonea* at work storing her nest, and thought it would be interesting to pursue Fabre's method and find out whether she were equally persistent in following her regular routine. We allowed her to carry in one grasshopper to establish her normal method of procedure, and found that, bringing it on the wing, she dropped it about six inches away, ran into the nest, out again, and over to the grasshopper, which she straddled and carried by the head to the entrance. She then ran down head first, turned around, came up, and, seizing it by the head, pulled it within. On the following day, when she had brought the grasshopper to the entrance of the nest, and while she was below, we moved it back five or six

<sup>1</sup> *Instincts and Habits of the Solitary Wasps*, p. 232, 1898.

inches. When she came out she carried it to the same spot and went down as before. We removed it again with the same result, and the performance was repeated a third and a fourth time; but the fifth time that she found her prey where we had placed it, she seized it by the head and, going backward, dragged it down into the nest without pausing. On the next day the experiment was repeated. After we had moved the grasshopper away four times, she straddled it and carried it down into the nest, going head foremost. On the fourth and last day of our experiment she replaced the grasshopper at the door of the nest and ran inside seven times, but then seized it and dragged it, going backward into the nest.

How shall this change in a long-established custom be explained except by saying that her reason led her to adapt herself to circumstances? She was enough of a conservative to prefer the old way, but was not such a slave to custom as to be unable to vary it.